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Before the
Committee on Energy and Commerce
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Allocation Policies to Assist and Benefit Consumers
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The Consumer Allocation for Efficiency :
How Allowance Allocations Can Protect Consumers, Mobilize Efficiency, and Contain the Costs of GHG Reduction

INTRODUCTION

Chairman Markey, Ranking Member Upton and members of the subcommittee, I appreciate the opportunity to speak with you today about the importance of allocation decisions and energy efficiency investments in containing the costs of our nation's GHG reduction program.

I am Richard Cowart, a Director of the Regulatory Assistance Project, a non-profit organization that provides technical and policy research and assistance to governmental decision-makers on energy and environmental issues. RAP has worked in more than 40 US states and has trained government officials in 16 other nations. Prior to joining RAP I served for 13 years as Commissioner and Chair of the Vermont Public Service Board, and for five years as an Assistant Professor of Planning and Environmental Law and director of the Program in Planning and Law at the University of California, Berkeley. Over the past six years I have had the privilege to assist the state and regional initiatives working to design carbon cap-and-trade programs in the US, including the Regional Greenhouse Gas Initiative (RGGI) in the Northeast, and the California, Oregon, and Western Climate Initiatives in the West.

Summary:

This testimony focuses on two of the critical elements in the architecture of a cap and trade system for the US power sector: (1) *how allowances are allocated* within the sector, and (2) how those allocations can be managed *to benefit consumers, especially by accelerating investments in energy efficiency,* which would permit more rapid carbon reductions at lower cost to consumers and the American economy. These two issues are closely connected and should be considered together. The testimony advances four points:

- **Price is not enough.** While one of the essential purposes of cap-and-trade systems and carbon tax proposals is to deliver a price signal to producers and consumers of energy, **a climate program that attempts to reduce emissions through price alone will be much more costly** than a comprehensive program that includes proven techniques to deliver low-carbon resources, especially cost-effective efficiency resources. This is especially true in the power sector. At the consumer level, higher power prices alone will not reduce

demand nearly enough to meet our carbon goals. At the generator level, it requires a high carbon price to make a meaningful change in the dispatch of the generation fleet. In both cases, the prices required to produce deep reductions are high enough to raise practical political barriers to the reductions now called for by climate science.

- **Foundation policies are needed.** State policies and utility programs that deliver end use efficiency and renewable power are the key to cost containment for federal carbon legislation. These programs are not merely "complementary" to the cap-and-trade design, they are the **essential foundation stones** of a successful national program. In particular, **energy efficiency is the cornerstone resource**, the key to cost containment, and the equivalent of a "carbon scrubber" for the electric power sector. Analysis of the recently-adopted carbon management plan in California reveals that over 75% of the carbon savings in that plan will come from programs and policies, and only 25% will be delivered by the effect of the carbon cap itself. The national cap-and-trade program should acknowledge, build upon, and provide revenue for the state and utility programs that deliver low-carbon energy solutions. The ACES draft now under review in this Committee is commendable for its comprehensive attention to many of these issues.

- **Allocation choices will have a dramatic effect on the cost of a GHG program for consumers**. Free allocation to generators leads to two problems: First, by giving carbon allowances to emitters, these programs confer windfall gains on many generators and cost consumers more than needed to achieve a given level of reduction. In some power markets, the cost to consumers in rates could be many times higher than the actual cost of reduction. Second, free allocation to generators misses an important opportunity to enhance energy efficiency, which is the least expensive and most effective way to lower carbon output.

- **Allocate allowances for consumer benefit, especially for efficiency investments.** Fortunately, there are sound design alternatives. Cap-and-trade designs have been developed in the Northeast, in California, and elsewhere that would make efficiency an integral part of the carbon-reduction program. These designs lower the cost of GHG reductions by allocating allowances for consumer benefit, and where cost-effective, investing allowance values in programmatic efficiency measures. Congress should build on this state and regional experience by: (a) **allocating power sector allowances to states or local distribution utilities (LDCs)** under state PUC or other public review, acting as trustees for consumers, and (b) **ensuring that a sizable portion of allowance value is invested in efficiency measures** that will lower emissions, power prices, and energy bills for families and businesses.

STATEMENT

As the United States launches an economy-wide cap-and-trade program, there are compelling reasons to focus design work on the US power sector. The power sector is the largest single source of industrial pollution, accounting for 37% of U.S. global warming gasses.[1] Carbon

1. *See* U.S. ENVIRONMENTAL PROTECTION AGENCY, TABLE ES-6: U.S. GREENHOUSE GAS EMISSIONS

dioxide emissions from the U.S. power sector exceed the *total national* GHG emissions of every other nation except China.[2] The electric power sector is also traditionally regulated, is not vulnerable to international competition, and consists of a reasonably small number of known sources. It is not a surprise that major cap-and-trade efforts on both coasts have begun first with the power sector, as it is probably the easiest large sector to manage. The sector is also expected to supply a large fraction of total emissions reductions sought under national climate bills.

However, significantly reducing emissions from the power sector will not be easy. About half of the nation's electric power comes from coal generation, and coal use continues to grow. For a decade, natural gas combined cycle plants provided the large majority of new capacity additions. Gas prices and availability concerns are now driving renewed interest in coal for new generation. Although a number of planned coal plants have recently been cancelled, more than 26,000 MW of new coal generation are now under construction or fully permitted.[3] Load growth continues, renewable sources can cover only a part of the new demand, and nuclear power is unlikely to provide significant new capacity to regional grids.[4] Meanwhile, fossil fuel prices continue to rise, the economy is in recession, and cost containment is a critical policy objective.

Two lessons emerge from this mix of challenges. First, it makes sense to design a cap-and-trade system that works well for the power sector, even if that means treating the sector differently than other sectors are treated. Second, the climate program must focus on the best ways to contain costs to consumers by moderating windfall transfer payments to generators, and delivering low-cost, low-carbon resources, especially end use energy efficiency.[5]

I. Cap and Market Realities: Why Carbon Prices Alone Will Not Deliver Needed GHG Reductions in the Power Sector

Economists and policy-makers often assume that a carbon tax or its equivalent, such as an auction of pollution credits,[6] will significantly reduce the electric power sector's carbon footprint if set at a realistic level. Those reductions are expected to come chiefly from two sources: demand reductions by consumers, and changes in the generation mix. In reality, it is

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ALLOCATED TO ECONOMIC SECTORS (2006).

2. INTERNATIONAL ENERGY AGENCY, CARBON DIOXIDE EMISSIONS BY ECONOMIC SECTOR 2005, 1–2 (2005), *available at* http://earthtrends.wri.org/pdf_library/data_tables/cli2_2005.pdf.

3. National Energy Technology Laboratory January 2009.

4. ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2008 WITH PROJECTIONS TO 2030 67–68 (2008), *available at* http://www.eia.doe.gov/oiaf/aeo/chapters.html. *See also* PAUL L. JOSKOW, THE FUTURE OF NUCLEAR POWER IN THE UNITED STATES: ECONOMIC AND REGULATORY CHALLENGES 2 (2006), *available at* http://tisiphone.mit.edu/RePEc/mee/wpaper/2006-019.pdf (predicting that the supply of electricity from nuclear power will reach zero in about 2030 if investment in new plants is not forthcoming).

5. R. Cowart, *Carbon Caps and Efficiency Resources* 33 Vermont Law Review 201-223 (2008) explores many of the issues touched on in this testimony. While the essential arguments are unchanged, the text has been modified and updated here.

6. Power cost increases will occur whether tradable allowances are sold at auction or distributed to emitters for free. Most economists agree that once credits are made tradable through a cap and trade system, they represent an opportunity cost to emitters and will put upward pressure on power prices in wholesale markets regardless of whether they were initially sold to emitters or distributed for free. CONG. BUDGET OFFICE, SHIFTING THE COST BURDEN OF A CARBON CAP-AND-TRADE PROGRAM 17 (2003), *available at* http://www.cbo.gov/doc.cfm?index=4401. *See also* DALLAS BURTRAW ET AL., THE EFFECT OF ALLOWANCE ALLOCATION ON THE COST OF CARBON EMISSION TRADING 15–25 (2001), *available at* http://www.cba.ufl.edu/purc/docs/presentation_2004Palmer_Effect.pdf (analyzing three different approaches for distributing carbon emission allowances under an emission-trading program in the electricity sector).

very difficult to produce significant reductions in either location at carbon prices that governments in the United States can realistically expect to impose.

A. Carbon Prices Alone Will Not Deliver an Adequate Consumer Conservation Response

On the demand side, it is difficult through price signals alone to inspire a conservation response among consumers that will deliver an adequate level of investment in end-use efficiency. Cap-and-trade architects know that lowering carbon emissions from power plants will raise the cost of electricity, and they assume that those price increases will reduce consumption. Influenced by standard economic theory on internalized external costs, they often view increased power prices as desirable, and any resulting demand reductions as merely a consequence of the program. A better approach is to view avoidable increased costs as undesirable, and efficiency as an integral component of the cap-and-trade program.

There are two related reasons for this approach. To begin with, there are numerous, well-documented market barriers to cost-effective efficiency investments. [7] For example, builders do not pay the energy bills in the offices and homes they build. Consumers are confused by energy choices and apply very high discount rates to incremental costs for energy efficiency. Many homeowners do not expect to live in a home long enough to recover the savings from efficiency improvements, even though the investment may be cost-effective over the life of the structure. A new American Council for an Energy-Efficient Economy (ACEEE) study reports that up to 50% of residential energy use in the U.S. is affected by such barriers. Even large industrial customers tend to under-invest in efficiency and need further technical and financial incentives to apply energy-saving solutions.

Those market barriers are not removed by carbon prices being applied to power generators They will continue to block needed improvements, despite any rate increases that could possibly be expected to flow from a politically-acceptable carbon cap-and-trade program.

Moreover, whether due to market barriers or not, there is solid evidence extending over several decades that demand for electricity in our modern economy is relatively inelastic. Demand does respond somewhat to price, but the long-term reduction due to price increases is relatively small.[8] Over twenty years, a 10% increase in power prices will reduce demand by just 2.5% to 3%. This would only offset the normally expected load growth in less than two of those twenty years. It would take a much larger rate increase just to offset expected load growth, much less to produce reductions in demand that could permit absolute reductions in emissions from the nation's huge generation fleet.

B. Carbon Prices Delivered to Generators Must be Quite High to Significantly Alter

7. There is extensive literature detailing these market barriers, including access to information, high first-cost problems, consumers' high discount rates, unpriced externalities, the landlord-tenant problem, and others. *See, e.g.*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, QUANTIFYING THE EFFECTS OF MARKET FAILURES IN THE END-USE OF ENERGY iii-vi (2007), *available at* http://www.aceee.org/energy/IEAmarketbarriers.pdf (detailing the various types of market barriers to end-use energy efficiency.)

8. The long-term price-elasticity of demand is approximately -0.25 to -.32. The U.S. DOE's National Energy Modeling System (NEMS) has price elasticity built into it. Their long run elasticity (assuming price effects remain for 20 years) are -0.31 for residential electric use and -0.25 for commercial electric use. Steven H. Wade, Price Responsiveness in the NEMS Buildings Sector Model (Sept. 9, 1999), *available at* http://www.eia.doe.gov/oiaf/issues/building_sector.html.

Generator Dispatch

The second problem with cap-and-trade designs that rely on carbon prices to alter power sector emissions results from the make-up of the U.S. generation fleet. It takes a high carbon price to materially alter the dispatch order and therefore emissions resulting from generation in the usual course of business. While this fact can be demonstrated through complex power models, the reasons are logical and straightforward:

- On a daily and hourly basis, power plants are dispatched largely in the order of their marginal operating costs. In competitive wholesale markets, they are dispatched in the order of their bid prices, which are logically based on those marginal costs.

- Because they do not burn fossil fuels, power plants with the lowest GHG emissions—such as hydro stations and wind farms—tend to have low marginal costs. Therefore, they are dispatched whenever they are available. Nuclear units are also dispatched whenever they are available. Thus, the existence of high carbon prices does little to cause these low-emitting units to run more often.

- Carbon prices will force modest improvements in the performance of fossil plants. Some relatively efficient plants will displace less efficient plants in the dispatch order. However, these impacts will be small in GHG terms. To greatly improve the emissions profile of the existing U.S. power fleet, it would be necessary for a large number of lower-emitting gas units to displace a large number of higher-emitting oil and coal units in the dispatch.

- Carbon taxes and allowance auction prices affect all fossil units to some degree. Therefore, carbon prices would drive up the cost of gas as well as coal. It will take a relatively high price to cause the marginal price of coal generation to exceed the marginal price of gas generation across many MWhs of operation.

C. Wholesale Power Markets Can Deliver Windfall Gains to Generators and Multiply the Cost of Carbon Reduction to Consumers

Applying high carbon prices to marginal generation units can greatly raise the cost of the carbon program to consumers, particularly if the total cost to consumers is measured on the cost-per-ton of avoided GHG emissions. This problem has been documented in a variety of studies.

One report from the Electric Power Research Institute modeled the effect of various levels of carbon taxes or allowance prices in the upper Midwest, which is highly dependent on coal, and in Texas, which relies heavily on gas.[9] That study found that in the upper Midwest, a carbon charge of $25/ton would raise wholesale power prices $21/MWh. This would almost double the wholesale price of electricity in that region, but have little impact on emissions. "[E]ven a CO_2 value of $50/ton would produce only a 4 percent reduction in regional emissions given the current generation mix."[10]

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9. Victor Niemeyer, *The Change in Profit Climate: How Will Carbon-Emissions Policies Affect the Generation Fleet?*, PUBLIC UTILITIES FORTNIGHTLY, May 2007, at 20, 24.

10. *Id.*

In Texas, the problem is different, but the result is similar. Because gas plants comprise a large fraction of the ERCOT mix, and are at the margin already, high carbon prices raise the price of power with very little impact on overall emissions: "When gas is selling for around $8/MMbtu, even a CO_2 value of $40/ton produces little emissions reduction" from the existing mix.[11]

Another recent study looked at the same question in the PJM Interconnection, the power pool covering the Mid-Atlantic region and much of the Midwest. The PJM study estimates the increased wholesale energy market prices, and cost to consumers, that would result from various cap and trade proposals in the year 2013. PJM estimates that, if the price of carbon dioxide emission allowances were $20 per ton, then the "impact on the PJM Energy Market could be power price increases as high as $15/MWh, and market-wide expenditures increase by as much as $12 billion, while providing emission reductions from PJM sources of approximately 14 million tons."[12] As Sonny Popowski, the Pennsylvania Consumer Advocate points out, the impact on consumers *in the power market* is far higher than the marginal cost of carbon *in carbon markets*. The PJM study suggests that PJM customers could pay $12 billion in higher energy prices in 2013 in order to reduce emissions by 14 million tons, which comes out to ***a cost of over $850 per ton*** of carbon dioxide reduction.[13]

It is important to note here that extreme price impacts are not inevitable. They are in fact avoidable through sound program design, employing three design elements. First, the climate program will need to rely substantially on programs and policies, not just carbon prices, to deliver low-carbon resources to the power mix. Policies such as renewable electricity standards, efficiency programs and standards and low-carbon R&D programs will add low-carbon resources to the power system without requiring across-the-board increases in power clearing prices to pull them into the mix. Second, allowances should be auctioned to emitters, and allowance value should be recycled for the benefit of consumers. And third, the majority of auction proceeds should be invested in low-cost energy efficiency, which will provide greater benefits to consumers over time than short-term cash payments or bill reductions.

D. Most Savings Will Come From Programs and Policies, Not Carbon Prices

One of the most important lessons of cap-and-trade analysis performed in the RGGI region and in California to implement AB32 is the growing understanding that most of the GHG reductions that will occur during the period of the planned cap-and-trade system will come about as a result of regulatory programs and policies, and not as a result of the price constraints imposed by the cap. These programs are not merely "complementary" to the cap-and-trade design, they are the **essential foundation stones** of a successful GHG reduction program. In particular, **energy**

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11. *Id.*

[12] *Potential Effects of Proposed Climate Change Policies on PJM's Energy Market*, PJM, January 23, 2009 (at page 25).

[13] The reductions in carbon emissions will occur through the displacement of some coal generation by natural gas generation, which typically has a higher fuel cost, but a lower carbon emission rate than coal. As noted above, the high consumer cost per ton of reduction is due to the carbon adder having raised the clearing price of power across the entire market, including prices paid to the legacy nuclear units whose costs and operations are largely unaffected by the GHG program. See Testimony of Sonny Popowski, Consumer Advocate of Pennsylvania, Subcommittee on Energy and Environment, US House Energy and Commerce Committee, March 12, 2009.

efficiency is the cornerstone resource, the key to cost containment, and the equivalent of a "carbon scrubber" for the electric power sector.

Analysis of the recently-adopted carbon management plan in California provides the clearest evidence of this reality. The Global Warming Solutions Act (AB 32) calls for California to reduce greenhouse gas emissions to 1990 levels by 2020 (i.e., 30 percent from business-as-usual emission levels projected for 2020), or about 15 percent from today's levels.

The AB 32 Scoping Plan developed by the California Air Resources Board in consultation with the California Energy Commission and Public Utilities Commission recognizes the need for policies and programs that complement and strengthen cap-and-trade to achieve these aggressive reductions, in both capped (i.e., covered by cap-and-trade) and uncapped sectors. [14] These policies include: (1) expanding and strengthening existing energy efficiency programs as well as building and appliance standards; (2) achieving a statewide renewables energy mix of 33 percent; (3) implementing the Pavley fuel efficiency standards and low carbon fuel standard and (4) creating targeted fees, including a public goods charge on water use**.**

While termed "complementary policies," these initiatives are in fact the principal means of GHG reductions in California, **accounting for more than 75% of the emission reductions that California expects to achieve in the capped sectors**—i.e., for transportation fuels, energy sector, industrial sources and natural gas use.[15] **The role of these foundation policies for the electricity sector alone is even more striking.** By 2020, increases in energy efficiency and renewables through standards, regulatory reforms and expanded program incentives are expected to reduce greenhouse gas emissions to a level 6 MMT ***below*** baseline emission levels for this sector. That is, ***complementary policies in the electricity sector will account for more than 100% of this sector's proportional emission reductions by 2020***, and will be providing net reductions that will be of value in other sectors of the economy. [16]

The California AB 32 experience provides two crucial lessons for federal legislation: First, low-carbon policies can play a powerful role in reducing GHG emissions, and in reducing the cost of delivering GHG reductions. Second, since many low-carbon programs and policies (e.g., building codes, utility efficiency programs) are in fact delivered by state, local, and utility administrators across the nation, national climate legislation will need to recognize and support those mechanisms to deliver needed national GHG reductions.

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[14] The sectors covered by cap-and-trade under the Scoping Plan are energy sector, transportation fuels, industrial sources and natural gas use.

[15] AB 32 Scoping Plan October 2008 at p.21. (77% of the reductions in capped sectors are attributable to these foundation policies).

[16] AB 32 Scoping Plan, Appendix F, Table 44: California GHG Inventory by Category as Defined in the Scoping Plan. This table shows that the 2020 forecast of "business as usual" emissions for the electricity sector (both in-state generation and imported electricity) at 139.2 MMT, and 2002-2004 average numbers (as close to the 1990 baseline available for electricity emissions in the report) at 109 MMT. From Table 2 of the Scoping Plan, electricity end-use energy efficiency measures account for 15.2 MMT. Subtracting expected energy efficiency and RPS savings due to complementary policies in the electricity sector (15.2 and 21.3 MMT, respectively) from 139.2 MMT "business as usual" emissions in 2020 from that sector yields 102.70 MMT—or about 6 MMT below the 2002-2004 baseline level of emissions for the electricity sector.

The ACES bill under discussion today is notable in its recognition of these issues by the inclusion of important sections to create a Renewable Electricity Standard, an Energy Efficiency Resource Standard, Congressman Welch's proposal to support greater energy efficiency in buildings, among other provisions. These mechanisms, and many other policies and programs delivered by states and local governments will create the foundation of lower-cost emission reductions to support an effective carbon cap-and-trade program.

II. Energy Efficiency is the Cornerstone of a Successful Climate Program

A. The Efficiency Reservoir is Large and Still Largely Untapped

To many knowledgeable observers, the highest-priority solution to reduce power system emissions is aggressive, accelerated investment in energy efficiency. Several well-documented studies demonstrate that the cost-effective reservoir of efficiency opportunities is large enough to meet 50% to 100% or more of all new electric demand.[17]

The efficiency reservoir can be tapped at low cost. End-use efficiency is the least costly means to significantly reduce carbon emissions from the power sector. Cost-effective efficiency provides "avoided tons" of carbon at negative cost. By any measure, this approach is less expensive than low-emission generation alternatives. In electricity markets, the efficiency savings potential has been shown to be on the order of 25% of total electricity usage at a levelized cost of about three cents per kilowatt-hour (kWh).[18] This is much less than the average national retail price of electricity, currently more than 8 cents per kWh.[19] This is also less than the marginal generation cost of new power plants, estimated, depending on the technology, to cost 5 to 10 cents per kWh, and sometimes much more.[20] Energy efficiency is the equivalent of a low-cost "carbon scrubber" for the power sector.

The scale of the efficiency-based emissions reduction potential is also significant. Intergovernmental Panel on Climate Change (IPCC) studies reveal that across many sectors, the efficiency potential is quite large; the buildings sector provides one of the largest sources of

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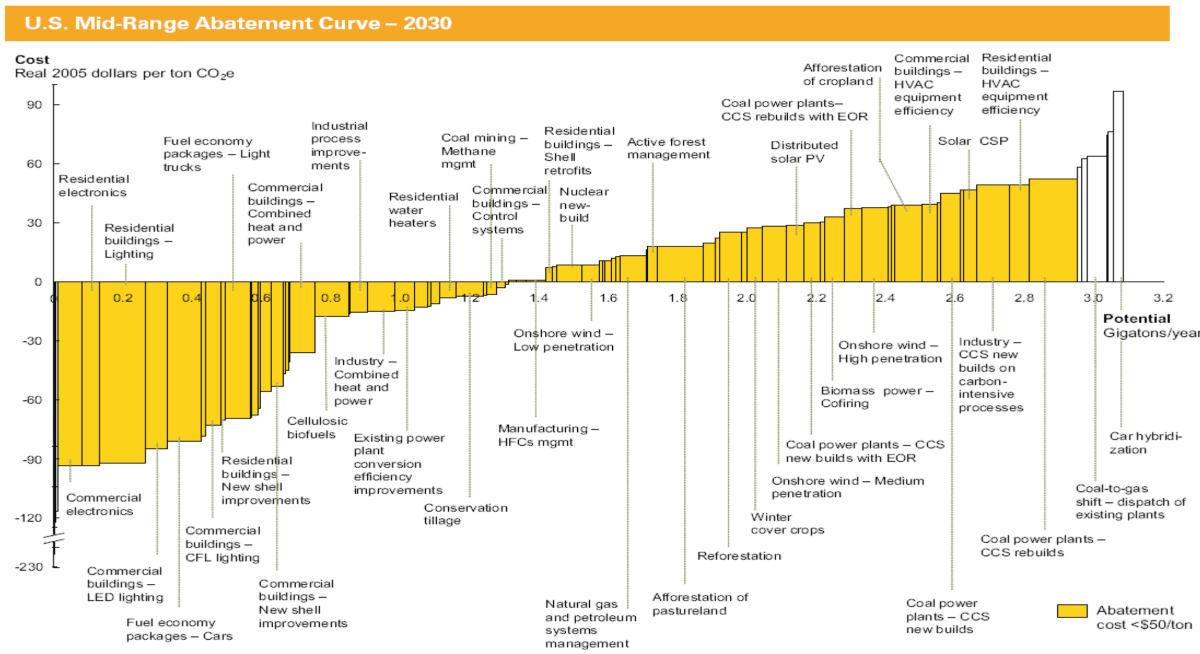
17. *See, e.g.*, INTERLABORATORY WORKING GROUP ET AL., SCENARIOS OF U.S. CARBON REDUCTIONS: POTENTIAL IMPACTS OF ENERGY TECHNOLOGIES BY 2010 AND BEYOND 1.5, tbl.1.1 (1997), *available at* http://enduse.lbl.gov/projects/5lab.html (follow "Chapter 1 - Analysis Results" hyperlink under "Publications") (comparing the country's projected energy usage in both "business-as-usual" and "efficiency" scenarios between 1997 and 2010). More recent studies in the western and northeastern U.S. have reached similar conclusions. *See* THE SOUTHWEST ENERGY EFFICIENCY PROJECT, THE NEW MOTHER LODE at 1-6 (2002), *available at* http://www.swenergy.org/nml/New_Mother_Lode.pdf (stating that "there is large potential for increasing the efficiency of electricity use and reducing load growth in the southwest region"); OPTIMAL ENERGY, INC., ECONOMICALLY ACHIEVABLE ENERGY EFFICIENCY POTENTIAL IN NEW ENGLAND 5 (2005), *available at* http://www.neep.org/files/Updated_Achievable_Potential_2005.pdf (explaining that there are numerous opportunities to obtain energy savings in the residential, commercial, and industrial sectors).

18. *See* MARTIN KUSHLER ET AL., FIVE YEARS IN: AN EXAMINATION OF THE FIRST HALF-DECADE OF PUBLIC BENEFITS ENERGY EFFICIENCY POLICIES, 29, 30 tbl.5 (2004), *available at* http://www.aceee.org/pubs/u041.htm (stating that the efficiency programs in the aggregate are very cost-effective, with savings ranging from $0.023 to $0.044/kWh).

19. Energy Information Administration, Total Electric Power Summary Statistics (Aug. 25, 2008), http://www.eia.doe.gov/cneaf/electricity/epm/tablees1a.html.

20. LAZARD, LEVELIZED COST OF ENERGY ANALYSIS – VERSION 2.0 at 2 (2008), *available at* http://www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20(2).pdf.

GHG emission reductions occurring through efficiency actions.[21] Another recent study conducted by the McKinsey consulting firm for the Natural Resources Defense Council (NRDC) found that by 2050 energy efficiency could reduce U.S. carbon dioxide emissions by 40%: 16% from buildings; 13% from transportation and smart growth communities; and 11% from industrial efficiency.[22] The results of this analysis through 2030 are shown in figure 1 below.



Source: McKinsey analysis

Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.

Figure 1: Cost of Energy Efficiency Measures and Scale of Potential in U.S. Through 2030

Figure 1 ranks GHG reduction potential by cost from left (greatest savings to implement) to right (most expensive to implement). The width of the bars represents the magnitude of potential GHG reductions in each category of actions. The carbon reduction options on the left end of the graph are almost all energy efficiency technologies. These efficiency options show a negative net cost of CO_2 abatement and account for almost half of the total emission reductions on the graph. Importantly, the net financial savings from the efficiency options offset the costs of the emission reductions on the right side of the graph—those with net positive costs. These efficiency technologies are therefore essential to achieving an entire package of emissions reductions at a low net cost to the economy.

Analyses in the U.S., as in most countries, "have shown that the efficiency potential has been tapped only in small measure."[23] These analyses, coupled with the IPCC and McKinsey studies,

21. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE IPCC), CLIMATE CHANGE 2007: MITIGATION 9, 10 tbl.SPM.3 (Bert Metz et al. eds. 2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg3.htm (follow "Chapter 11: Mitigation from a cross-sectoral perspective") [hereinafter MITIGATION]. This is partly attributable to the fact that the IPCC's methodology includes electricity generation related GHG emissions in the end-use sectors rather than in the energy supply sector. *Id.* at 10.

22. NATURAL RESOURCES DEFENSE COUNCIL, THE NEW ENERGY ECONOMY: PUTTING AMERICA ON THE PATH TO SOLVING GLOBAL WARMING 6 fig.1 (2008),

23. STEVEN R. SCHILLER ET AL., ENERGY EFFICIENCY AND CLIMATE CHANGE MITIGATION

confirm that efficiency presents a major opportunity for addressing climate change.[24] Furthermore, these studies show that with policy commitments, aggressive efficiency investments can meet most of the expected growth in U.S. energy demand. “Accelerated energy efficiency technology development can arrest the growth in GHG emissions that would otherwise occur with continuing demand growth, especially in the power sector.”[25]

The most detailed analysis of the efficiency potential in a US carbon program was recently completed for the California GHG reduction plan mandated by AB32, and confirms the general point. The analysis of greenhouse gas emissions reductions in California demonstrates that complementary programs to increase energy efficiency could save up to 14 million metric tonnes of CO2 per year at a net savings between $80 and $100 per tonne of CO2 reduction. This includes all the costs associated with installing energy efficiency measures in homes and businesses—including financial incentives, customers’ out-of-pocket expenditures and program administration. To put this amount of CO2 reduction in perspective, California’s electric sector emits on the order of 100 million tonnes per year. This means that energy efficiency alone could reduce those annual emissions by an impressive 14% and save consumers money in the process.[26]

B. Cap-and-Trade Basics: Why Cap-and-Trade Must Be Designed to Support Efficiency

One of the principal aims of cap-and-trade programs is to lower the overall societal cost of environmental improvement. Since it will cost far less to avoid carbon emissions through energy efficiency than by adding or substituting expensive low-emissions generation on the grid it is entirely consistent with the overall goals of cap-and-trade to design a trading system that builds directly on efficiency as a resource. Simply stated, a carbon program that directly mobilizes end-use efficiency will cost less and achieve more than one that focuses only on generators. However, realizing these opportunities will take policy actions, including improvements in the allocation of carbon credits in any national cap-and-trade program.

There is pretty broad agreement among air experts that the U.S. Acid Rain Program and similar programs modeled on it—including the NO_x trading program—have successfully lowered emissions at a lower cost than historic command and control systems. The success of this model has led many decision makers to conclude that carbon cap-and-trade programs should be built on the same basic structure. However, this does not mean that we should extend this model directly to carbon cap-and-trade systems. There are several crucial differences.

- First, carbon reduction programs are going to involve a lot more dollars including much

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POLICY 3 (2008), *available at* http://www.schiller.com/images/Schiller_et_all_energy_efficiency_climate_paper.pdf (providing policy recommendations for reducing greenhouse gas emissions through increased energy efficiency); *see also* INTERLABORATORY WORKING GROUP ON ENERGY-EFFICIENT AND CLEAN ENERGY TECHNOLOGIES, SCENARIOS FOR A CLEAN ENERGY FUTURE 7.1 (2000), *available at* http://www.ornl.gov/sci/eere/cef/index.htm (follow “Chapter 7 — Electricity Sector” hyperlink under “Main Report”) (noting that “significant opportunities exist to reduce the demand for electricity”); STEVEN NADEL ET AL., THE TECHNICAL, ECONOMIC AND ACHIEVABLE POTENTIAL FOR ENERGY-EFFICIENCY IN THE U.S. 1 (2004), *available at* http://aceee.org/conf/04ss/rnemeta.pdf (explaining that “a very substantial, technical, economic and achievable energy efficiency potential remains in the U.S.”).

24. SCHILLER, note 24, at 3.
25. *Id.*
26. Analysis performed by Ethree, for the California Air Resources Board, Scoping Plan for AB 32 (2008).

larger economic transfer payments over time. Any flaws in architecture will have a much greater impact on both efficiency and equity goals.

- Second, energy markets are profoundly different today. When the Acid Rain Program was designed, almost all generators were part of vertically-integrated, rate-regulated companies. Generators compliant with their emissions allotment did not need to purchase additional allowances. Generators needing to purchase allowances could pass through their direct costs in rate cases on a cost-of-service basis. In either case, vertically-integrated utilities, regulated on a cost-of-service basis, could charge consumers only their direct compliance costs. Today, U.S. power markets are much more complex, and about half of the power sold passes through wholesale markets that are not rate-regulated. In those markets, carbon policy can raise the price of all power sold in the market, including power from plants that have no carbon costs. As a result of these market effects, cap-and-trade designs that might work well in about half the nation would confer windfall gains on generators and inequitable results for consumers in the other half.[27]

- Third, control options for carbon and conventional pollutants are quite different. SO_x and NO_x reductions can usually be attained by generators at power stations through changes in fuel inputs—switching to low-sulfur coal, for example—or plant modifications, such as scrubbers. In contrast, there is today no practical way to add a carbon scrubber to a conventional power plant.[28] Real reductions in carbon intensity will come primarily from actions taken mostly by power buyers. Such actions include substituting gas or renewables in the resource mix of a load-serving entity (LSE) or adding more efficiency and reducing consumption generally. Consumers—not fossil generators—will need to take and pay for these actions. It is widely understood that the Acid Rain Program did almost nothing to promote end-use efficiency, while a climate change program will have inspire substantial end-use efficiency improvements in order to be effective.

C. The Good News: Efficiency Programs are More Powerful than Price Increases or Supply-side Carbon Prices

The existence of market barriers and inelastic demand does not means that efficiency resources must be tapped through proven techniques that surmount those obstacles. More than two decades of experience with utility DSM programs has demonstrated in practice that well-managed efficiency programs can deliver significant savings to the power grid, and thus can lower carbon emissions at a low cost to the nation.

The power system will realize about five to seven times more savings from each dollar spent in a well-managed efficiency program—in MWh and resulting GHG emissions—than it will through a generalized, across-the-board price increase. The following example illustrates this reality. The example calculates the reductions in GHG emissions likely to result from two

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27. Using the single-price auction rules now governing organized wholesale markets, all generators get the benefit of higher clearing prices, and all consumers have to pay (some immediately, some later when long-term contracts turn over). If fossil units setting the clearing price raise their bids due to the value of allowances they must use, costs will rise for consumers across all MWh sold in that market. These costs to consumers can be much higher than the actual cost of allowances to generators, especially if the allowances were awarded to emitters for free.

28. Burning low-sulfur coal or scrubbing emissions of conventional pollutants do not materially alter the carbon content of the emission stream, while carbon capture and storage options are at present too costly to be realistic as add-on options for existing power plants.

cases using the generation, rates, and sales characteristics of a large U.S. Midwestern state:

(a) Adding a 3% increase in prices, such as might result from a rate increase or a small increase in fuel prices due to an upstream carbon tax or auction price; and
(b) Taking the same 3% rate increase or carbon cost, but assuming that the revenue is invested in utility-sponsored or third-party energy efficiency programs at a cost of 3 cents/kWh.[29]

Due to the low price-elasticity of demand for electricity, the rate increase itself would result in a small decrease in demand and a corresponding reduction in emissions. If the proceeds from a system benefit charge or carbon credit auction are invested in programmatic energy efficiency, however, the savings are much greater—in both MWhs and in GHG emission reductions.[30] Figure 2 illustrates that investing the proceeds of a carbon charge in energy efficiency in this manner will in fact increase the savings by a factor of five in the first decade.[31] Extended over a longer time frame, the GHG savings will grow to seven times larger through intentional efficiency programs than through the price increase alone.[32]

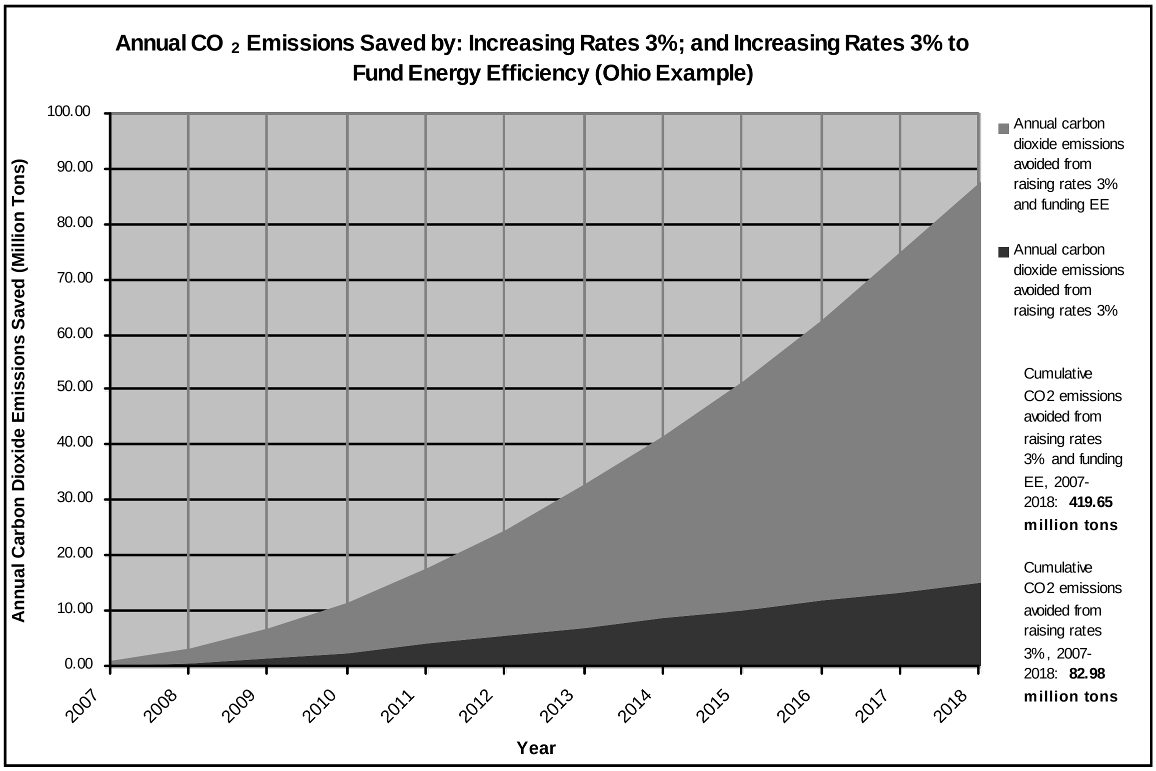

Figure 2: Efficiency programs save 5 to 7 times more carbon than carbon taxes or auction prices (for the same consumer cost)

29. Many successful efficiency programs deliver significant savings at an average cost of roughly 3 cents per kWh saved. MARTIN KUSHLER ET AL., *supra* note 18, at 30 table.5.

30. A system benefit charge is a charge on consumers' bills from an electric distribution company to pay for the costs of certain public benefits such as low-income assistance and energy efficiency.

31. Given Ohio's consumption levels and power mix, raising rates without adding programmatic energy efficiency investments would save about 83 million tons of CO_2 between 2007 and 2018; raising rates along with energy efficiency investment would save nearly 420 million tons over the same period.

32. Over a twenty-year period the ratio stabilizes at about 7:1. This is because some of the early efficiency measures are retired, and program funds are used to replace the savings they were delivering.

Pollution programs that focus only on the supply side raise the price of electricity but only incidentally reduce demand. For a given cost to consumers, society can reduce much more carbon pollution through energy efficiency programs than it can through cap-and-trade programs that focus only on the supply side, raise the price of electricity, but only incidentally reduce demand.

III. Cap-and-Trade Design Choices for Efficiency and Cost Containment

How can cap-and-trade architecture mobilize efficiency for carbon reduction?

A. Lessons from RGGI and the Northeast States: The Consumer Allocation

The Regional Greenhouse Gas Initiative (RGGI) is the leading effort in the United States to cap GHG emissions from the power sector. The RGGI region now extends to ten states, stretching from Maine to Delaware.[33] The RGGI Memorandum of Understanding sets out the essential elements of a proposed Model Rule, which are being adopted by each participating state.[34] Rulemakings have been completed across the region, and with cap-and-trade implementation is beginning in 2009.[35]

One of the key achievements of the RGGI process has been the creation of a formal consumer allocation of carbon credits, rather than the automatic allocation of all credits to generators on the basis of their historic emissions.[36] This is a significant departure from previous cap-and-trade regimes. Depending on how states implement this objective and the market price of allowances, it will substantially advance investments in energy efficiency in the RGGI region. A recent analysis by the RGGI state staff found that if 100% of RGGI allowances were auctioned in each state, per capita energy efficiency program spending could increase by 10% to 443% for each state if allowances sell for $2 per ton; or by 15% to 664% if allowances sell for $3 per ton.[37]

Both experience and economic studies show that there can be very large generator windfalls from the wrong type of carbon allocation. Several studies on the free allocation of carbon allowances to generators have found the likelihood of substantial windfall gains to generators. One study prepared for RGGI estimated that total generator windfalls from 100% historic free allocation could total $1 billion or more annually.[38] More generally, the Congressional Budget Office found that for the nation as a whole, "[p]roducers would have to receive only a modest portion of the allowances to offset their costs from a cap on carbon emissions."[39] European

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33. Six states in New England, plus New York, New Jersey, Delaware, and Maryland have enacted implementing regulations. Pennsylvania is officially an observer state.

34. REGIONAL GREENHOUSE GAS INITIATIVE MEMORANDUM OF UNDERSTANDING, 6–7 (2005), *available at* http://www.rggi.org/docs/mou_12_20_05.pdf . While styled as a "regional" effort, there is no regional governmental body with regulatory authority to implement RGGI. Individual states must enact their own regulations, simply agreeing to recognize carbon credit trading with credits from other states on a reciprocal basis. *Id.* at 7.

35. Press Release, Reg'l Greenhouse Gas Initiative, RGGI States Announce Preliminary Release of Auction Application Materials (July 11, 2008), http://www.rggi.org/docs/20080711news_release.pdf.

36. MEMORANDUM OF UNDERSTANDING, *supra* note 34, at 6.

37. REG'L. GREENHOUSE GAS INITIATIVE (RGGI), POTENTIAL EMISSIONS LEAKAGE AND THE REGIONAL GREENHOUSE GAS INITIATIVE 19 (2008), *available at* http://www.rggi.org/docs/20080331leakage.pdf.

38. DALLAS BURTRAW ET AL., ALLOCATION OF CO_2 EMISSIONS ALLOWANCES IN THE REGIONAL GREENHOUSE GAS CAP-AND-TRADE PROGRAM 52 tbl.19 (2005), *available at* http:/www.rff.org/documents/RFF-DP-05-25.pdf.

39. CONG. BUDGET OFFICE, ISSUES IN THE DESIGN OF A CAP-AND-TRADE PROGRAM FOR CARBON EMISSIONS 4 (2003), *available at* http://www.cbo.gov/doc.cfm?index=4861&type=0. Others have found that generators would

governments that initially allocated allowances to generators on a free, historic basis are now reversing course and moving to an auction-based system.[40]

Broad Support for Efficiency and the Consumer Allocation

In December 2005, the governors of seven of the RGGI states signed the RGGI Memorandum of Understanding, which includes a provision requiring each state to assign at least 25% of its carbon allowances to a consumer allocation.[41] Shortly thereafter, Vermont enacted legislation confirming Vermont's participation in RGGI and creating a 100% consumer allocation of carbon credits to be applied entirely to energy efficiency.[42] The legislation stated:

> In order to provide the maximum long-term benefit to Vermont electric consumers, *particularly benefits that will result from accelerated and sustained investments in energy efficiency* and other low-cost, low-carbon power system investments, the public service board . . . *shall establish a process to allocate 100 percent* of the Vermont statewide budget of tradable power sector carbon credits and the proceeds from the sale of those credits through allocation to one or more *trustees acting on behalf of consumers*. . . .[43]

Vermont thus became the first jurisdiction to create a substantial consumer allocation of power sector carbon credits and the first to use those credits to finance expanded investments in energy efficiency.[44]

Other states in the RGGI region are also allocating a significant percentage of allowance proceeds to energy efficiency. For example, in New York, the largest RGGI state, up to 97% of allowances will be auctioned, with up to 100% of auction proceeds dedicated to improving energy efficiency.[45] In Connecticut at least 70% of allowance proceeds will be invested in energy efficiency and conservation programs.[46] In Maine, most allowance proceeds will be transferred to a consumer benefit account, with a portion targeted at manufacturing facilities' combined usage of heat and power.[47] Massachusetts Department of Energy Resources

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require as little as 11% of allowances to recover their compliance costs in a cap-and-trade program. DALLAS BURTRAW & KAREN PALMER, RESOURCES FOR THE FUTURE, COMPENSATION RULES FOR CLIMATE POLICY IN THE ELECTRICITY SECTOR 41 (2007), *available at* http://www.rff.org/rff/Documents/RFF-DP-07-41.pdf.

40. *See, e.g.*, ENVIRONMENTAL AUDIT COMMITTEE, THE INTERNATIONAL CHALLENGE OF CLIMATE CHANGE: UK LEADERSHIP IN THE G8 & EU, 2004-5, H.C. 105, at 17, *available at* http://www.publications.parliament.uk/pa/cm200405/cmselect/cmenvaud/105/105.pdf (stating that "[w]e also noted that the use of grandfathering as a means to allocate emissions permits is likely to result in substantial windfall profits for power generators throughout the EU").

41. *See* MEMORANDUM OF UNDERSTANDING, *supra* note 34, at 6. In 2007, Massachusetts, Rhode Island and Maryland signed the Memorandum of Understanding and joined the initiative. Regional Greenhouse Gas Initiative History, http://www.rggi.org/about/history (last visited Sept. 21, 2008).

42. 2006-123 VT. ADV. LEGIS. SERV. 1 (LexisNexis) (codified at VT. STAT. ANN. tit. 30 § 255(c)(2) (2007).

43. *Id.* (emphasis added).

44. In 2008, the Vermont legislature revisited this issue, confirmed the consumer allocation for efficiency, and directed that the credit value be used to support efficiency in buildings across all fuels on a "whole buildings" basis. *See* Vermont Energy Efficiency and Affordability Act, 2008-92 Vt. Adv. Legis. Serv. 11, 15 (LexisNexis) (to be codified at VT. STAT. ANN. tit. 30 § 235) (stating that "programs, measures, and compensation mechanisms shall include fuel efficiency services that . . . produce whole building and process heat efficiency").

45. ENVIRONMENT NORTHEAST, STATE POLICY STATUS (2008), *available at* http://www.env-ne.org/public/resources/pdf/ENE_RGGI_StatePolicyStatusTable_082908.pdf.

46. Id.

47. Press Release, State of Maine, Dep't of Envtl. Prot., DEP Issue Profile: Regional Greenhouse Gas

regulations express an intention to use the proceeds for energy efficiency, and additional legislation is pending.[48] Currently, most states are in the process of codifying how allowances are used through proposed legislation and rulemaking proceedings. Between 90% and 100% of allowances currently are expected to be auctioned in each state. Some of the states are directing a percentage of allowances for certain set-asides or direct allocations, but these are transitional and are expected to phase out over time. In every state that is in the more advanced stages of its decision-making, energy efficiency is the primary activity for RGGI allowance proceeds. **Across the ten-state RGGI region, approximately 90% of total allowances will be auctioned, with as much as 80% of auction revenues (roughly 70% of total allowance value) dedicated to investments in end-use energy efficiency.**

This history is persuasive evidence of the importance of efficiency in carbon management: in a region of the country that has deep experience with efficiency programs and benefits, all ten RGGI states have adopted policies to auction emission allowances to generators and to apply the large majority of auction proceeds to deeper efficiency attainment. Governors, legislators, and regulators across the region are convinced that the RGGI consumer allocation for efficiency will lower power costs, lower carbon costs, and the cost of the RGGI program generally.

B. Creating the Consumer Allocation in National Legislation

The simplest way to mitigate generator windfalls, and reduce the unnecessary rate impacts of a generator-based cap, is to **award almost all of the power sector's allowances in each compliance period to consumers, represented by their local distribution companies (LDCs) or other supervised trustees** acting on their behalf.[49] By selling these allowances in the allowance market to emitters, consumers' agents can recover some of the generator windfall that flows from the structure of today's wholesale power market. This revenue-recapture mechanism is essentially a market-based means of doing through program design a part of what regulators historically would have done through cost-of-service ratemaking.

A consumer allocation focused mainly on local distribution companies has the additional advantage of treating consumers in all parts of the country on an even basis. As noted earlier, about half of the power sold today is sold by generators in wholesale markets with "single clearing price" rules, while generation in other states and regions remains under the historic vertically-integrated, rate-regulated system. Because of these differences, awarding free allocations to generators would produce greatly different results for shareholders and for consumers in different states. But in all regions of the nation, there is a common denominator in the local distribution company, which remains a regulated wires monopoly. The National Association of Regulatory Utility Commissioners (NARUC) has concluded that to protect consumers and to provide even treatment across the nation, allowances should be allocated to the LDCs, supervised on behalf of consumers (or given to other consumer trustees created and supervised by the states). The NARUC Resolution on point, adopted in 2007, states:

Initiative (July 23, 2008), http://maine.gov/dep/air/greenhouse/pdf/RGGI%20issue%20profile%20(2).pdf.

48. Massachusetts Department of Environmental Protection, Frequently Asked Questions: Regional Greenhouse Gas Initiative (RGGI), http://www.mass.gov/dep/air/climate/rggifaq.htm (last visited Oct. 9, 2008).

49 Depending on how large various "off the top" allocations are, the consumer allocation should comprise about 35% to 40% of total allowances.

> "Any emissions allowance allocation program *should assign all allocated allowances available to the electricity sector to local distribution companies* providing a regulated local distribution function for end-user customers (including vertically-integrated utilities, distribution utilities, rural-electric cooperatives, municipal distribution systems, and all other entities providing distribution service directly to end-user customers subject to State regulation or its equivalent). This approach will allow State PUCs or other authorities to ensure that the value of these no-cost allowances will inure to the benefit of end-use consumers. Alternatively, States should be able to adopt other methods for distributing benefits to end-use consumers."[50]

The Consumer Allocation is not simply a matter of accommodating the states. Under well-established principles of ratemaking, LDCs will have to account for the receipt of allowance value as utility income, and will need to recycle the revenue to advance consumer welfare. As NARUC more recently pointed out, "such an allocation ensures that allowance value will be used for public purposes rather than to enhance the profits of private investors. Under State regulation, this value would be passed along to the utility's consumers in the form of lower prices or through additional expenditures for energy efficiency or low-income assistance programs."[51]

C. Using the Consumer Allocation to Support Efficiency and Lower the Cost of Carbon Management

Recapturing and recycling generator price increases to consumers will lower the consumer cost of a carbon capture program. But in what form should those benefits be returned to consumers? Some consumer advocates will naturally propose that revenues from the sale of carbon credits should be returned to consumers in the form of rate rebates. However, this will not produce the best long-term results for consumers.

The best outcome for consumers as a whole, and the best way to lower the societal cost of carbon reduction, is to invest carbon credit revenues in low-carbon resources—especially low-cost energy efficiency measures. There is good evidence for this conclusion. For example, modeling runs conducted by ACEEE for RGGI revealed that increasing the region's spending on energy efficiency was the key to lowering the overall cost of RGGI's planned carbon reductions to the economy. That study found that doubling investments in energy efficiency throughout the RGGI region would lower projected load growth by two-thirds by 2024.[52] Efficiency also reduces carbon emissions, holding them roughly constant during the same period—compared to a 15% rise in the base case—and greatly reduces the cost of meeting RGGI's overall carbon objectives. The ACEEE study also concluded that doubling efficiency could avoid around 8,000 MW of new capacity additions, and by 2021 would reduce the average annual household power bill by over $100.

While the nation's supply of low-cost efficiency investment opportunities is not infinite, the

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[50] Resolution on Federal Climate Legislation and Cap-and-Trade Design Principles (Adopted by NARUC November 2007).(emphasis added).

[51] Letter from Frederick Butler, President of NARUC , and Commissioner Rick Morgan to OMB Director Peter Orszag March 17 2009.

52. WILLIAM PRINDLE, ET AL., ENERGY EFFICIENCY'S ROLE IN A CARBON CAP-AND-TRADE SYSTEM: MODELING RESULTS FROM THE REGIONAL GREENHOUSE GAS INITIATIVE iii (2006), *available at* http://aceee.org/pubs/e064.pdf?CFID=1812522&CFTOKEN=798299427.

untapped efficiency reservoir is quite large. Additional investments in cost-effective efficiency measures will provide a large initial block of carbon reduction at the lowest cost to consumers and the economy. Governments can provide a greater long-term benefit to consumers by selling carbon credits to emitters and investing the revenues in low-cost efficiency rather than using the funds to provide short-term consumer rebates. Recycling the credit revenues through efficiency services can lower the cost of carbon reduction to consumers and the economy. It can also advance other goals, including lower power bills, avoiding expensive transmission and distribution upgrades, and greater power system reliability.[53]

A comprehensive set of recommendations along these lines has been developed by a broad coalition of business, environmental, and efficiency groups, which concluded that "It is important to capture as much cost-effective energy efficiency as possible in order to meet climate goals and reduce the cost of a cap-and-trade program."[54] Their report concludes that investment is needed rising to about $15-20 billion each year for energy efficiency deployment programs and policies, with most of that revenue coming from the allocation or auction of carbon allowances. Proceeds from the consumer allocation recommended here would provide the revenue needed at the state and local levels to develop and implement those efficiency programs and carbon reductions.

D. Adding a *Performance Incentive to the Consumer Allocation*

This testimony has set out the reasons for allocating power sector emission allowances to local distribution utilities or other state-supervised trustees on behalf of consumers. It has also demonstrated the reasons that a large fraction of that allowance value, to total $15 billion to $20 billion per year, should be dedicated to consumer benefits via energy efficiency investments.

We now turn to the question of how allowances should be allocated among the states and LDCs. While many different formulas are possible, they will need to balance a variety of factors, including:

- Recognizing the baseline emission rates and MWh sales levels in each state or service territory;
- Ensuring that the formula does not reward increased per capita consumption or penalize effective efficiency efforts in the states;
- Accounting for appropriate load growth associated with underlying population growth;
- Smoothing out volatility in demand and consumption due to short-term weather conditions;
- Providing adequate incentives to state and local governments and utilities to help customers reach greater levels of end-use efficiency; and
- Ensuring that all states and regions of the nation are treated equally and fairly.

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53. Reduced consumption will lower power market clearing prices, producing an anti-windfall effect benefiting all consumers; it will lower power bills for consumers who install efficiency measures; and it will lower demands on transmission facilities and improve reliability. For an overview of the multiple benefits of power sector end-use efficiency, see RICHARD COWART, EFFICIENT RELIABILITY: THE CRITICAL ROLE OF DEMAND-SIDE RESOURCES IN POWER SYSTEMS AND MARKETS (2001), *available at* http://www.raponline.org/Pubs/General/EffReli.pdf.

54 *Reducing the Cost of Addressing Climate Change Through Energy Efficiency*, Consensus Recommendations for Future Federal Climate Legislation in 2009. Signatories include the Alliance to Save Energy and ACEEE, along with the American Institute of Architects, the Real Estate Roundtable, the National Association of Energy Service Companies, the Sierra Club and the Natural Resources Defense Council.

While the initial distribution of allowances can be based entirely on a formula that weighs such factors as historic emissions, historic consumption, and population, in later years, performance in the delivery of energy efficiency should also become a factor. The inescapable point is that increased cost-effective efficiency in any state will provide benefits to consumers, the environment, the nation's energy security, regional power reliability, and to the economy. It is thus in the nation's interest to provide support and incentives to states, local governments, and utilities to improve end-use efficiency. At the same time, we should recognize that many of the public programs and policies that deliver end-use efficiency do not necessarily require significant spending to be successful (e.g., codes and standards, education programs, market transformation activities).

The national program should not focus exclusively on *spending for efficiency*, but also on *measured improvements in efficiency* – regardless of spending levels. Over time, a growing fraction of the overall consumer allocation should be distributed to states and utilities on a performance basis. One advantage of this approach is that this part of the national program would not need to mandate spending levels, or dictate methods or means of achieving efficiency goals. States, local governments, utilities, and third parties should be free to use a variety of techniques and to experiment. Building codes, standards, incentives, utility programs, ratemaking, smart growth policies, competitive acquisition, and other techniques could all be supported without the need for national rules or standards. Here are some of the key features of the performance allocation:

- At first, allowances could be allocated to every state based on its historic emissions and energy consumption.
- After an initial ramp-up period of four to five years, the national program administrator should establish standard measures for the distribution of allowances to states to reflect their rate of improvement in efficiency.
- Each state's annual allocation would be based on demonstrated improvement *against that state's own historic baseline*, providing an even-handed way to encourage greater efficiency in each jurisdiction. This approach would not favor today's most active states on efficiency, nor those where the opportunities are greater. The administrator should take recent state efficiency initiatives into account by setting the baseline years prior to their implementation.
- The metrics used to assess efficiency attainment should be *broad-based and top-down*. There are many ways to deliver efficiency improvements, and many debates over claiming responsibility for them. A top-down measurement, such as the per-capita consumption of residential and commercial energy measured in source BTUs, would provide a broad assessment of a state's success in delivering energy efficiency without the need to measure and evaluate individual policies, programs, or installations.

A performance-based allocation of carbon allowances, within the national consumer allocation program, would promote and reward the multitude of state and local actions that are necessary to deliver greater energy efficiency in millions of customer locations and communities across the nation

IV. CONCLUSIONS

National climate change legislation faces the daunting challenge of setting a path to achieve deep reductions in GHG emissions while moderating both societal economic costs and consumer costs from the program. Greatly enhanced end-use energy efficiency is critical to achieving all of these goals, and national climate legislation should be designed to capture efficiency resources. It could do so both through direct federal actions and by providing incentives to states, utilities, and other service providers. In particular:

- Portfolio management policies such as renewable standards, environmental dispatch, loading orders giving priority to efficiency investments, and efficiency resource standards will provide the most carbon savings and lower the cost of any power sector cap-and-trade system. Merely increasing the price of fossil power through carbon taxes or credit auctions will not significantly shift generation or reduce demand and will therefore be an expensive path to GHG reductions.

- To reduce generator windfalls and contain consumer costs, allowances should be allocated to local distribution companies or other consumer trustees supervised by government regulators. Free allocation of carbon credits to generators based on historic emissions can lead to substantial windfall gains to generators, especially in today's organized wholesale markets.

- A carbon program that directly mobilizes end-use efficiency will cost less and achieve more than one that focuses only on generators. Thus, an auction of emissions allowances with revenues devoted to energy efficiency is a positive way to use the "polluter pays" principle and to fund low-cost GHG reductions at the same time.

- Over time, a growing fraction of power sector allowances should be awarded to states and local utilities on a performance basis to recognize and fund success in advancing energy efficiency within the states.

Thank you for your time and consideration this morning. I would be happy to answer questions when appropriate..